Turbine	Property											
	Lettershaws Farm	Leadhills Road	North Shortcleugh	South Shortcleugh	Hass	Waterhead Toll Cottage	New Glendorch	Glencaple Farmhouse	Glencaple	Leadhills	Dentercleuch	Snar Farm
T15	2	0	0	0	0	2	2	2	2	2	2	2
T16	2	0	0	0	0	2	2	2	2	2	2	2
T17	0	0	2	0	0	2	0	2	2	2	2	2
T18	2	0	0	0	0	2	2	2	2	2	2	2
T19	2	0	0	0	0	2	2	2	2	2	2	2
T20	0	0	2	0	0	2	0	2	2	2	2	2
T21	2	-3	0	0	0	2	0	2	2	2	2	2

Table B3 - Wind turbine sound power levels (dB L_{Aeq}) used in the noise assessment - the proposed Development.

Turbine make / model	Standardised 10 m Wind Speed (m/s)											
	1	2	3	4	5	6	7	8	9	10	11	12
Vestas V172-7.2 MW Unconstrained (PO7200 STE)	-	-	96.9	100.5	105.7	108.8	108.9	108.9	108.9	108.9	108.9	108.9
Vestas V172-7.2 MW Mode SO1	-	-	96.4	99.8	104.6	107.0	107.0	107.0	107.0	107.0	107.0	107.0
Vestas V172-7.2 MW Mode SO2	-	-	96.4	99.8	104.6	106.0	106.0	106.0	106.0	106.0	106.0	106.0
Vestas V172-7.2 MW Mode SO3	-	-	96.4	99.8	104.1	105.0	105.0	105.0	105.0	105.0	105.0	105.0
Derived from Vestas specification document: 'Performance Specification EnVentus V172-7.2 MW 50/60 Hz' hub height sound power levels adjusted to 134 m proposed hub height against standardised 10 m wind speeds, with 2 dB uncertainty included.												

Table B4 - Octave band sound power spectrum (dB L_{Aeq}) for reference wind speed conditions (v_{10} = 11 m/s) - the proposed Development

Turbine make / model	Octave Band Centre Frequency (Hz)								
	63	125	250	500	1000	2000	4000	8000	A
Vestas V172-7.2 MW	90.2	97.7	102.2	104.0	102.9	98.9	92.2	82.5	108.9
Derived from Vestas specification document: 'Third Octave noise emission EnVentus V162-6.2 MW', 1/3 octave spectrum at hub height combined to 1/1 octave spectrum at reference wind speed of 11 m/s with 2 dB uncertainty included.									

Turbine & Propagation Details: Clyde Windfarm

B.1. Clyde Windfarm is built and operating. Coordinates for the Clyde Windfarm turbines relate to turbines (numbered and prefixed 'C') with a total capacity of 522 MW. Noise limits for the wind farm are based on the greater of 40 dB(A) or 5 dB above background noise levels day-time or the greater of 43 dB(A) or 5 dB(A) above background noise levels night-time[57].

B.2. Sound power levels for the Clyde wind turbines are taken from documents available to us for the Siemens SWT-2.3-93 wind turbine as referenced in the tables below. These sound power levels are considered to allow a suitable uncertainty margin (+1.5 dB) as required by the IOA GPG. They are also considered sufficiently robust when considering cumulative effects, as they would be unlikely to be higher without exceeding the Clyde Wind Farm site-specific noise limits.

Table B5 - Turbine coordinates – Clyde Windfarm

Turbine	Easting	Northing	**Turbine**	Easting	Northing	**Turbine**	Easting	Northing
C1	297658	626379	**C67**	298230	618706	**C124**	298202	615168
C2	297962	626490	**C68**	298589	618414	**C125**	297747	614906
C3	298172	626729	**C69**	299021	618741	**C126**	297737	614568
C4	298490	626805	**C70**	298719	618964	**C127**	297850	614203
C5	298793	626749	**C71**	298900	618270	**C128**	297907	613632
C6	299121	626816	**C72**	298631	618023	**C129**	298496	613520
C7	299427	626887	**C73**	298962	617919	**C130**	298137	613141
C8	299428	626528	**C74**	299347	617711	**C131**	297532	613294
C9	299129	626291	**C75**	299422	618066	**C132**	297271	613547
C10	299692	626705	**C76**	299698	617726	**C133**	297606	613834
C16	296475	623929	**C77**	300025	617777	**C134**	297322	614177
C17	296712	624150	**C78**	300295.3	617625	**C135**	297009	613900
C18	296994	624321	**C79**	300806	617192	**C136**	297784	612871
C19	297314	624354	**C80**	300402	617270	**C137**	297193	613010
C20	297634	624389	**C81**	300050	617398	**C138**	297447	612590
C21	297893	624252	**C82**	300518	616849	**C139**	297733	612297
C22	298120	624080	**C83**	300179	616579	**C140**	297680	611868
C23	298415	624215	**C84**	299797	616676	**C141**	297347	612220
C24	298768	624478	**C85**	300150	617050	**C142**	298091	612023
C25	299093	624433	**C86**	299755	617142	**C143**	298057	612537
C26	298458	623916	**C87**	299250	617245	**C144**	298432	612683
C27	298864	624110	**C88**	299032	617456	**C145**	298409	612241
C28	299317	624161	**C89**	298627	617551	**C146**	298820	612596
C29	299261	624954	**C90**	298218	617544	**C147**	298801	612152

57 Clyde Wind Farm information site: https://www.sserenewables.com/onshore-wind/great-britain/clyde

Turbine	Easting	Northing	Turbine	Easting	Northing	Turbine	Easting	Northing
C30	299535	624696	**C91**	297800	617660	**C148**	299105	612431
C31	299910.17	624913.76	**C94**	297164	617770	**C149**	298519	613136
C32	299838	625238	**C99**	301239	617343	**C150**	299302	612152
C39	298992	621230	**C100**	301647	617455	**C151**	299568	611869
C40	299308	621181	**C101**	301070	616866	**C152**	299519	612435
C41	299594	621072	**C102**	301272	616570	**C153**	299945	612403
C42	299870	620944	**C103**	301644	616384	**C154**	300339	612428
C43	300259	620967	**C104**	301436	617040	**C155**	300768	612262
C44	300620	620943	**C105**	301699	616806	**C156**	300943	611941
C45	300820	620692	**C106**	301978	617048	**C157**	300390	611995
C46	301015	620472	**C107**	302329	617117	**C158**	300710	611592
C47	301279	620263	**C108**	302637	616943	**C159**	301154	612311
C48	301290	619905	**C109**	302059	616571	**C160**	301126	611604
C49	300916	619812	**C110**	302774	616618	**C161**	299946	611949
C50	300526	619844	**C111**	303124	616545	**C162**	300212	611584
C51	300098	619916	**C112**	303511	616469	**C163**	299803	611585
C52	301646	619811	**C113**	303507	616045	**C164**	299776	610913
C57	302601	618793	**C114**	301857	615879	**C165**	299385	611012
C58	302884	618657	**C115**	302215	616068	**C166**	299192	611328
C59	302801	618241	**C116**	302516	616371	**C167**	299043	611693
C60	302694	617863	**C117**	302898	616133	**C168**	298852	611156
C61	302607	617454	**C118**	298497	614600	**C169**	298656	611550
C62	297220	618283	**C119**	298754	614302	**C170**	299036	610809
C63	297474	617987	**C120**	298612	613923	**C171**	298694	610589
C64	297737	617900	**C121**	298189	613850	**C172**	298545	611004
C65	298216	618003	**C122**	298274	614287	**C173**	298307	611309
C66	297918	618480	**C123**	298115	614663			
All turbines modelled assuming a hub height of 78 m								

Table B6 - Wind turbine sound power levels (dB L_{Aeq}) used in the noise assessment – Clyde Windfarm.

Turbine make / model	Standardised 10 m Wind Speed (m/s)											
	1	2	3	4	5	6	7	8	9	10	11	12
Siemens SWT-2.3-93	-	-	90.5	93.9	100.9	105.3	106.9	106.9	106.9	106.9	106.9	106.9
Derived from: Product specification document '*Standard Acoustic Emission, SWT-2.3-93, Rev 4'* sound powers levels at hub height adjusted to 78 m hub height levels against standardised wind speed at 10 m with 1.5 dB uncertainty added.												

Table B7 - Octave band sound power spectrum (dB L_{Aeq}) for reference wind speed conditions (v_{10} = 8 m/s) - Clyde Windfarm.

Turbine make / model	Octave Band Centre Frequency (Hz)								
	63	125	250	500	1000	2000	4000	8000	A
Siemens SWT-2.3-93	86.9	95.3	101.8	102.2	99.3	95.8	90.5	86.8	106.9
Derived from: Product specification document '*Standard Acoustic Emission, SWT-2.3-93, Rev 4'*. Based on 1/3 Octave band sound power spectrum converted to 1/1 octave bands at V_{10} = 10 m/s, normalised to 106.9 dB.									

Turbine & Propagation Details: Middle Muir Windfarm

B.3. Middle Muir Windfarm is built and operating. Coordinates for the Middle Muir Windfarm turbines relate to the Section 36 consent variation[58] granted by Scottish Ministers for 15 turbines (numbered and prefixed 'M#'). Sound power levels for the Middle Muir wind turbines are taken from documents made available to us for the installed REpower (Senvion) 3.4 M114 wind turbine as referenced in the tables below. In the absence of specific uncertainty information, an uncertainty margin of +2 dB(A) was added to the overall sound power levels at each wind speed from the supplied documentation. These sound power levels are therefore considered to allow for a suitable uncertainty margin as required by the IOA GPG.

B.4. Furthermore, a further uplift of +2 dB to the sound power emission level at each Middle Muir turbine was added to provide a robust cumulative noise assessment by adding an 'appropriate margin' required by the IOA GPG. It is unlikely that noise emission levels could be higher than the values shown in Table B10 without Middle Muir Windfarm exceeding relevant specific noise limits derived for that windfarm in isolation at the nearest controlling property Blairhill House (easting / northing 287597 624302).

Table B8 - Turbine coordinates – Middle Muir Windfarm

Turbine	Easting	Northing	Turbine	Easting	Northing
M1	286124	626586	**M9**	285286	624994
M2	285336	626157	**M10**	285789	625001
M3	285821	626181	**M11**	286257	625037
M4	286212	626024	**M13**	285214	624550
M5	285467	625745	**M15**	285505	624323
M6	285567	625402	**M18**	285398	623912
M7	286069	625454	**M19**	284983	624029
M8	286535	625441			
All turbines modelled assuming a hub height of 93.5 m					

Table B9 - Propagation attenuation effects due to terrain (dB) – Middle Muir Windfarm – Positive numbers are due to terrain shielding barrier effects (e.g. 2), representing a decrease in noise levels, and negative numbers (e.g. -3) represent an increase in predicted noise levels due to concave ground effects. Where there is a zero shown, neither terrain shielding nor concave ground were found.

Turbine	Property											
	Lettershaws Farm	Leadhills Road	North Shortcleugh	South Shortcleugh	Hass	Waterhead Toll Cottage	New Glendorch	Glencaple Farmhouse	Glencaple	Leadhills	Dentercleuch	Snar Farm
M1	2	2	2	2	2	2	2	2	2	2	2	2
M2	2	2	2	2	2	2	2	2	2	2	2	2
M3	2	2	2	2	2	2	2	2	2	2	2	2

[58] Middle Muir Section 36C variation, The Scottish Government, 22/03/2016 – Technical Appendix TA2: Operational Noise Assessment – August 2015

Turbine	Property											
	Lettershaws Farm	Leadhills Road	North Shortcleugh	South Shortcleugh	Hass	Waterhead Toll Cottage	New Glendorch	Glencaple Farmhouse	Glencaple	Leadhills	Dentercleuch	Snar Farm
M4	2	2	2	2	2	2	2	2	2	2	2	2
M5	2	2	2	2	2	2	2	2	2	2	2	2
M6	2	2	2	2	2	2	2	2	2	2	2	2
M7	2	2	2	2	2	2	2	2	2	2	2	2
M8	2	2	2	2	2	2	2	2	2	2	2	2
M9	2	2	2	2	2	2	2	2	2	2	2	2
M10	2	2	2	2	2	2	2	2	2	2	2	2
M11	2	2	2	2	2	2	2	2	2	2	2	2
M13	2	2	2	2	2	2	2	2	2	2	2	2
M15	2	2	2	2	2	2	2	2	2	2	2	2
M18	2	2	2	2	2	2	2	2	2	2	2	2
M19	2	2	2	2	2	2	2	2	2	2	2	2

Table B10 - Wind turbine sound power levels (dB L_{Aeq}) used in the noise assessment – Middle Muir Windfarm.

Turbine make / model	Standardised 10 m Wind Speed (m/s)											
	1	2	3	4	5	6	7	8	9	10	11	12
REPower (Senvion) 3.4M114 Unconstrainted Mode	-	-	99.4	101.8	105.5	108.1	108.2	108.2	108.2	108.2	108.2	108.2
Derived from Senvion specification document: 'Power Curve & Sound Power Levels – [3.4M114/50Hz] (Doc. No: SD-3.2-WT.PC.02-A-C-EN), sound powers levels at hub height adjusted to 93.5 m hub height levels against standardised wind speed at 10 m with 2 dB uncertainty added and further 2 dB uplift added to assume development operating up to its consented limit at its respective nearest property.												

Table B11 - Octave band sound power spectrum (dB L_{Aeq}) for reference wind speed conditions (v_{10} = 9 m/s) – Middle Muir Windfarm.

Turbine make / model	Octave Band Centre Frequency (Hz)								
	63	125	250	500	1000	2000	4000	8000	A
REPower (Senvion) 3.4M114	93.6	97.6	100.2	102.4	103.2	98.7	92.5	84.8	108.2
No spectral test information data was provided therefore spectral data given is based on the test report Windtest WT7497/09, for '3.4M104' model. Based on 1/3 Octave band sound power spectrum at V_{10} = 9 m/s, normalised to 108.2 dB.									

Turbine & Propagation Details: Andershaw Windfarm

B.5. Andershaw Windfarm is built and operating. Coordinates for the Andershaw Windfarm turbines relate to the consent (CL/07/0454/3[59]) to vary planning permission CL/07/0454[60] from South Lanarkshire Council for 11 turbines (numbered and prefixed 'A#'), with a maximum rotor diameter of 117 m and hub height of 80 m.

B.6. Sound power levels for the Andershaw wind turbines are taken from manufacturer documentation for the Vestas V117 3.45 MW wind turbine as referenced in the tables below. In absence of specific test data, these overall sound power levels include a +2 dB uncertainty margin on top of the values presented in the manufacturer documentation at each wind speed, therefore allowing for a suitable uncertainty margin. Based on the assessment of predicted levels at Andershaw Farm against the relevant limit for the nearest controlling property (Andershaw Farm (283105/625296), a further uplift of +1.5 dB to the sound power emission level at each Andershaw turbine was added to provide a robust cumulative noise assessment by adding an 'appropriate margin' required by the IOA GPG. It is unlikely that noise emission levels could be higher without Andershaw Windfarm exceeding relevant specific noise limits derived for that windfarm in isolation at its nearest controlling property.

Table B12 - Turbine coordinates – Andershaw Windfarm

Turbine	Easting	Northing	**Turbine**	Easting	Northing
A1	284543	624167	A9	285023	625387
A2	284313	624505	A11	284222	625861
A3	284819	624688	A12	285018	625764
A4	283884	625026	A13	284852	626193
A6	284671	624969	A14	284466	626297
A8	284232	625439			
All turbines modelled assuming a hub height of 80 m					

Table B13 - Propagation attenuation effects due to terrain (dB) – Andershaw Windfarm – Positive numbers are due to terrain shielding barrier effects (e.g. 2), representing a decrease in noise levels, and negative numbers (e.g. -3) represent an increase in predicted noise levels due to concave ground effects. Where there is a zero shown, neither terrain shielding nor concave ground were found.

Turbine	**Property**											
	Lettershaws Farm	Leadhills Road	North Shortcleugh	South Shortcleugh	Hass	Waterhead Toll Cottage	New Glendorch	Glencaple Farmhouse	Glencaple	Leadhills	Dentercleuch	Snar Farm
A1	2	2	2	2	2	2	2	2	2	2	2	2
A2	2	2	2	2	2	2	2	2	2	2	2	2
A3	2	2	2	2	2	2	2	2	2	2	2	2
A4	2	2	2	2	2	2	2	2	2	2	2	2
A6	2	2	2	2	2	2	2	2	2	2	2	2

[59] Andershaw Windfarm, Consent to vary planning permission, South Lanarkshire Council, CL/07/0454/3, 29 July 2015
[60] Andershaw Windfarm, Conditional Panning Permission, South Lanarkshire Council, CL/07/0454, 09 June 2014

Turbine	**Property**											
	Lettershaws Farm	Leadhills Road	North Shortcleugh	South Shortcleugh	Hass	Waterhead Toll Cottage	New Glendorch	Glencaple Farmhouse	Glencaple	Leadhills	Dentercleuch	Snar Farm
A8	2	2	2	2	2	2	2	2	2	2	2	2
A9	2	2	2	2	2	2	2	2	2	2	2	2
A11	2	2	2	2	2	2	2	2	2	2	2	2
A12	2	2	2	2	2	2	2	2	2	2	2	2
A13	2	2	2	2	2	2	2	2	2	2	2	2
A14	2	2	2	2	2	2	2	2	2	2	2	2

Table B14 - Wind turbine sound power levels (dB L_{Aeq}) used in the noise assessment – Andershaw Windfarm.

Turbine make / model	Standardised 10 m Wind Speed (m/s)											
	1	2	3	4	5	6	7	8	9	10	11	12
Vestas V117 3.45 MW (Hub height 80m) Mode 0	-	-	94.4	97.7	102.4	106.3	108.6	108.8	108.8	108.8	108.8	108.8
Derived from: Performance Specification 'DMS 0055-1397 V02, 'V117 3.45 MW Third octave noise emission', Date: 30/11/2016, with +2dB added for uncertainties in absence of specific test data and further 1.5 dB uplift..												

Table B15 - Octave band sound power spectrum (dB L_{Aeq}) for reference wind speed conditions (v_{10} = 11 m/s) – Andershaw Windfarm.

Turbine make / model	Octave Band Centre Frequency (Hz)								
	63	125	250	500	1000	2000	4000	8000	A
Vestas V117 3.45 MW (Hub height 80m)	90.8	98.0	100.9	102.5	103.1	100.8	96.8	85.7	108.8
Derived from: Derived from Vestas Document 'DMS 0055-1397 V02, 'V117 3.45 MW Third octave noise emission', Date: 30/11/2016. and adjusted 108.8 dB to include 2 dB uncertainty.									

Turbine & Propagation Details: M74 West Renewables Energy Park

B.7. M74 West Renewable Energy Park is currently in planning awaiting determination. Coordinates for the M74 West Renewable Energy Park turbines relate to their application for 22 turbines (numbered and prefixed 'ME) currently under consideration by Scottish Ministers[61] with a total capacity up to 165 MW.

B.8. Sound power levels for the M74 West Renewable Energy Park stated candidate wind turbines are taken from documents available to us for the Seimens Gamesa SG 6.6-155 wind turbine as referenced in the tables below. In absence of specific test data, these overall sound power levels include a +2 dB uncertainty margin on top of the values presented in the manufacturer documentation at each wind speed, therefore allowing for a suitable uncertainty margin. No uplift has been applied to these overall sound power levels as the predicted noise levels are at the site-specific noise limits proposed for M74 West Renewable Energy Park at the relevant controlling property (Greenfield 288097/624999).

Table B16 - Turbine coordinates – M74 West Renewable Energy Park

Turbine	Easting	Northing	Turbine	Easting	Northing
ME1	289226	628279	ME12	289303	626583
ME2	289653	628010	ME13	289747	626380
ME3	289983	627700	ME14	290183	626235
ME4	288602	627840	ME15	290787	626292
ME5	289004	627578	ME16	291256	626117
ME6	289398	627296	ME17	287557	626728
ME7	289907	627124	ME18	287965	626424
ME8	290496	626904	ME19	288535	626071
ME9	291024	626883	ME20	289421	625632
ME10	287981	627375	ME21	290002	625678
ME11	288776	626791	ME22	290089	625121
All turbines modelled assuming a hub height of 122.5 m					

Table B17 - Propagation attenuation effects due to terrain (dB) – M74 West Renewable Energy Park – Positive numbers are due to terrain shielding barrier effects (e.g. 2), representing a decrease in noise levels, and negative numbers (e.g. -3) represent an increase in predicted noise levels due to concave ground effects. Where there is a zero shown, neither terrain shielding nor concave ground were found.

Turbine	Property											
	Lettershaws Farm	Leadhills Road	North Shortcleugh	South Shortcleugh	Hass	Waterhead Toll Cottage	New Glendorch	Glencaple Farmhouse	Glencaple	Leadhills	Dentercleuch	Snar Farm
ME1	2	2	2	2	2	2	2	2	2	2	2	0
ME2	2	2	2	2	2	2	2	2	2	2	2	0

61 ECU00005019 – M74 West Renewable Energy Park – Chapter 10: Noise – Technical Appendix 10.2

Turbine	Property											
	Lettershaws Farm	Leadhills Road	North Shortcleugh	South Shortcleugh	Hass	Waterhead Toll Cottage	New Glendorch	Glencaple Farmhouse	Glencaple	Leadhills	Dentercleuch	Snar Farm
ME3	2	2	2	2	2	2	2	2	2	2	2	0
ME4	2	2	2	2	2	2	2	2	2	2	2	-3
ME5	2	2	2	2	2	2	2	2	2	2	2	-3
ME6	2	2	2	2	2	2	2	2	2	2	2	0
ME7	2	2	2	2	2	2	2	2	2	2	2	0
ME8	2	2	2	2	2	2	2	2	2	2	2	0
ME9	2	2	2	2	2	2	2	2	2	2	2	2
ME10	2	2	2	2	2	2	2	2	2	2	2	0
ME11	2	2	2	2	2	2	2	2	2	2	2	0
ME12	2	2	2	2	2	2	2	2	2	2	2	0
ME13	2	2	2	2	2	2	2	2	2	2	2	0
ME14	2	2	2	2	2	2	2	2	2	2	2	0
ME15	2	2	2	2	2	2	2	2	2	2	2	2
ME16	2	2	2	2	2	2	2	2	2	2	2	2
ME17	2	2	2	2	2	2	2	2	2	2	2	2
ME18	2	2	2	2	2	2	2	2	2	2	2	0
ME19	2	2	2	2	2	2	2	2	2	2	2	0
ME20	2	2	2	2	2	2	2	2	2	2	2	0
ME21	2	2	2	2	2	2	2	2	2	2	2	0
ME22	2	2	2	2	2	2	2	2	2	2	2	2

Table B18 - Wind turbine sound power levels (dB L_{Aeq}) used in the noise assessment – M74 West Renewable Energy Park

Turbine make / model	Standardised 10 m Wind Speed (m/s)											
	1	2	3	4	5	6	7	8	9	10	11	12
Seimens Gamesa SG 6.6-155 Unconstrained (AM0-6.6MW) Values include +2dB uncertainty margin			95.2	100.4	105.2	107.0	107.0	107.0	107.0	107.0	107.0	107.0
Derived from: Siemens Gamesa product specification document '*Standard Acoustic Emissions, Rev. 0, Mode AM 0, IEC Ed3*, document number D2311677/003, hub height values adjusted for standardised 10 m wind speeds and 2 dB added for uncertainty.												